

(12) **UK Patent Application** (19) **GB** (11) **2 336 867** (13) **A**

(43) Date of A Publication 03.11.1999

(21) Application No 9809155.6

(22) Date of Filing 28.04.1998

(71) Applicant(s)

State of Israel - Ministry of Defence
(Incorporated in Israel)
PO Box 2250, Armament Development Authority,
Rafael, Haifa 31 021, Israel

(72) Inventor(s)

Yehuda Karnienchick

(74) Agent and/or Address for Service

David Keltie Associates
12 New Fetter Lane, LONDON, EC4A 1AG,
United Kingdom

(51) INT CL⁶

E01F 9/047 // E01F 9/00 13/00

(52) UK CL (Edition Q)

E1G GLN

(56) Documents Cited

GB 2288419 A US 4362424 A

(58) Field of Search

UK CL (Edition P) E1G GLN

INT CL⁶ E01F 9/00 9/047 13/00

Online: WPI

(54) Abstract Title

Deformable speed hump

(57) A speed restriction device comprising an elongate hollow element (1) of a predetermined length, having an impervious casing (2) consisting of at least one upper surface presenting a hump (3). The upper surface of the casing is elastic and resilient, and on a side wall (4) of the casing, at least one vent (5) is provided to allow a flow of air out of the casing at a predetermined rate. The size of the vent may be adjustable to enable the device to be set for different speed limits. The casing is also provided with means to allow a flow of air back into the casing. The device imposes a speed restriction on vehicles travelling over the allowed speed limit, but minimises the inconvenience for vehicles travelling within the speed limit.

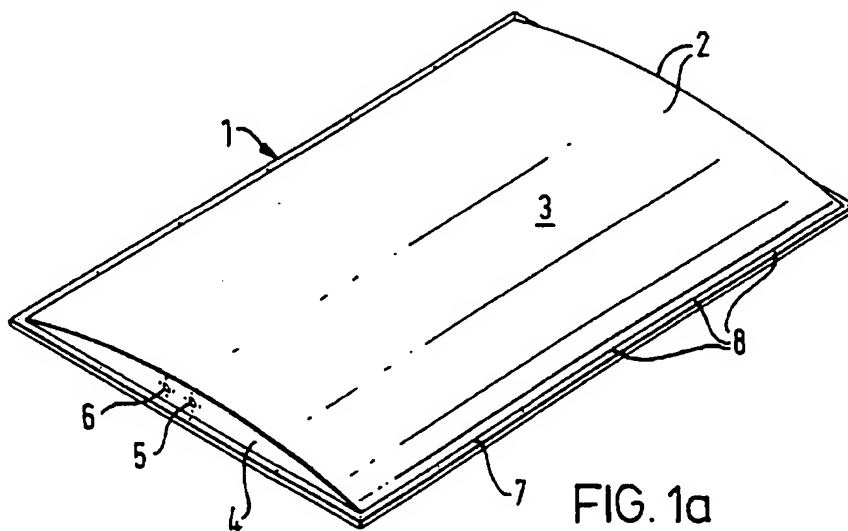
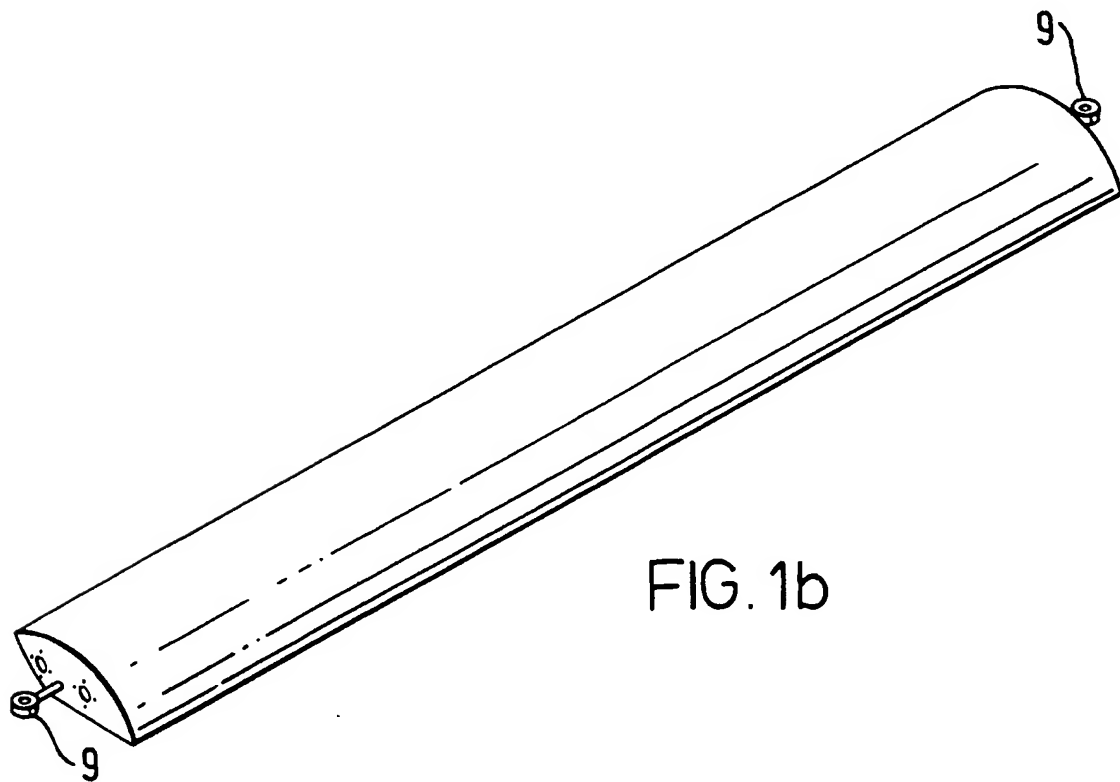
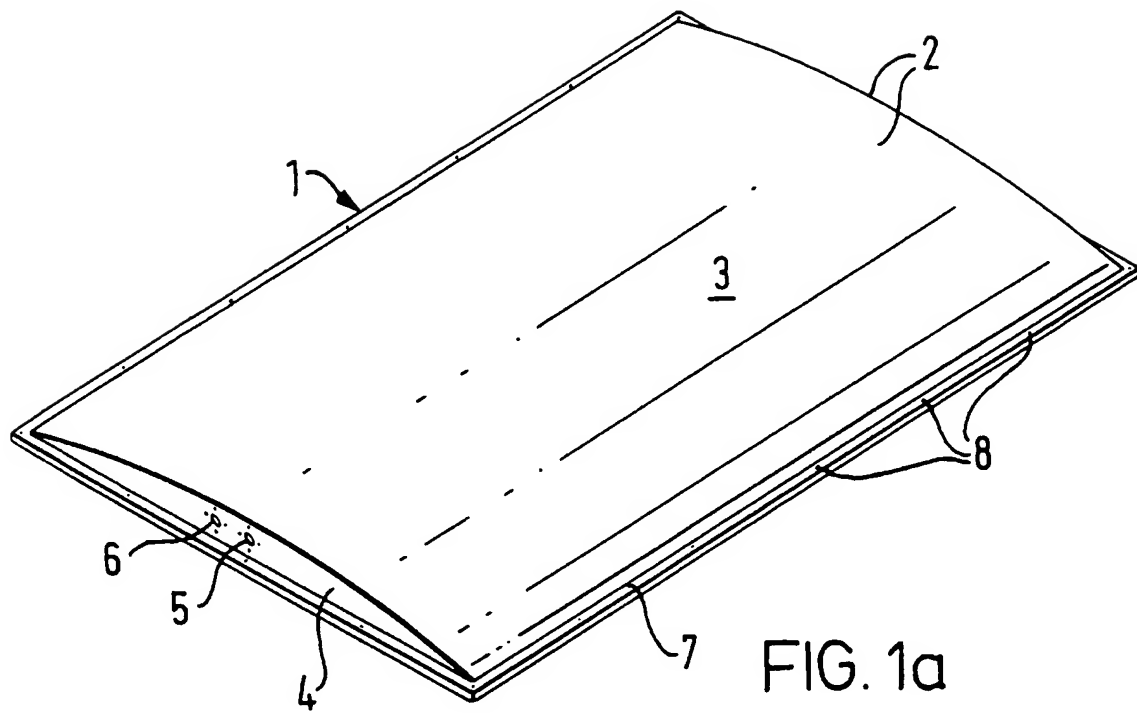


FIG. 1a



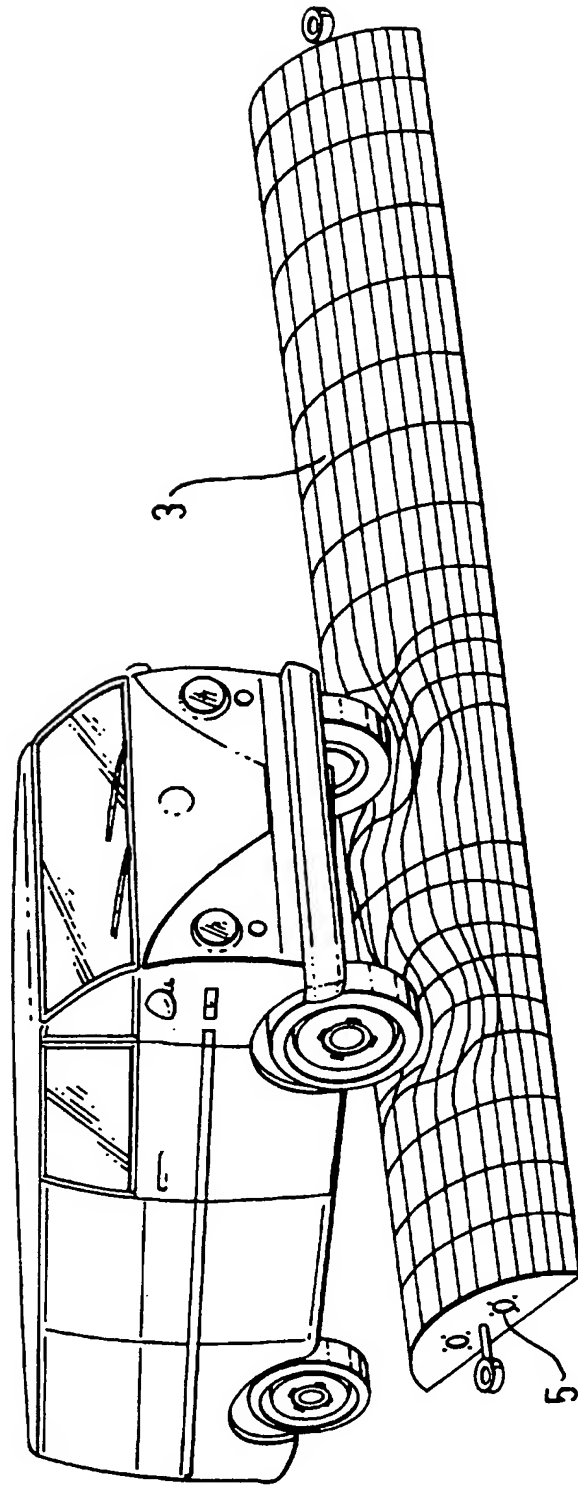


FIG. 2a

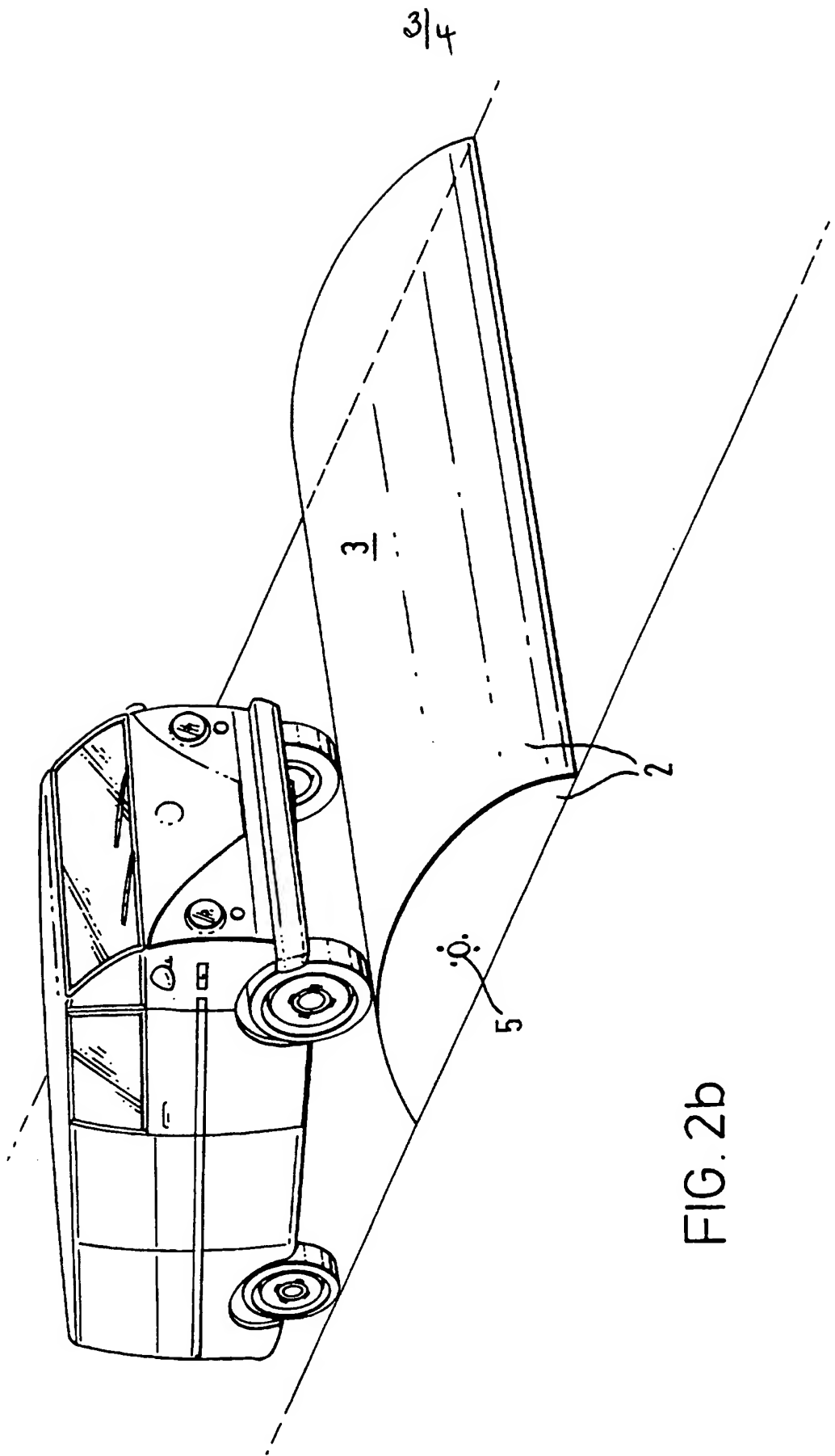


FIG. 2b

FIG. 3

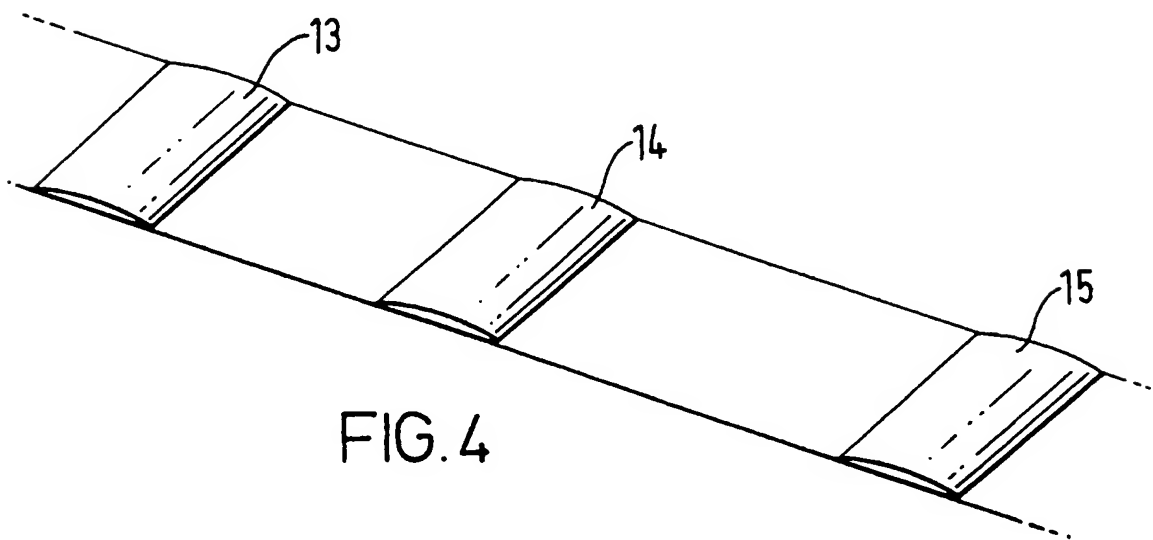
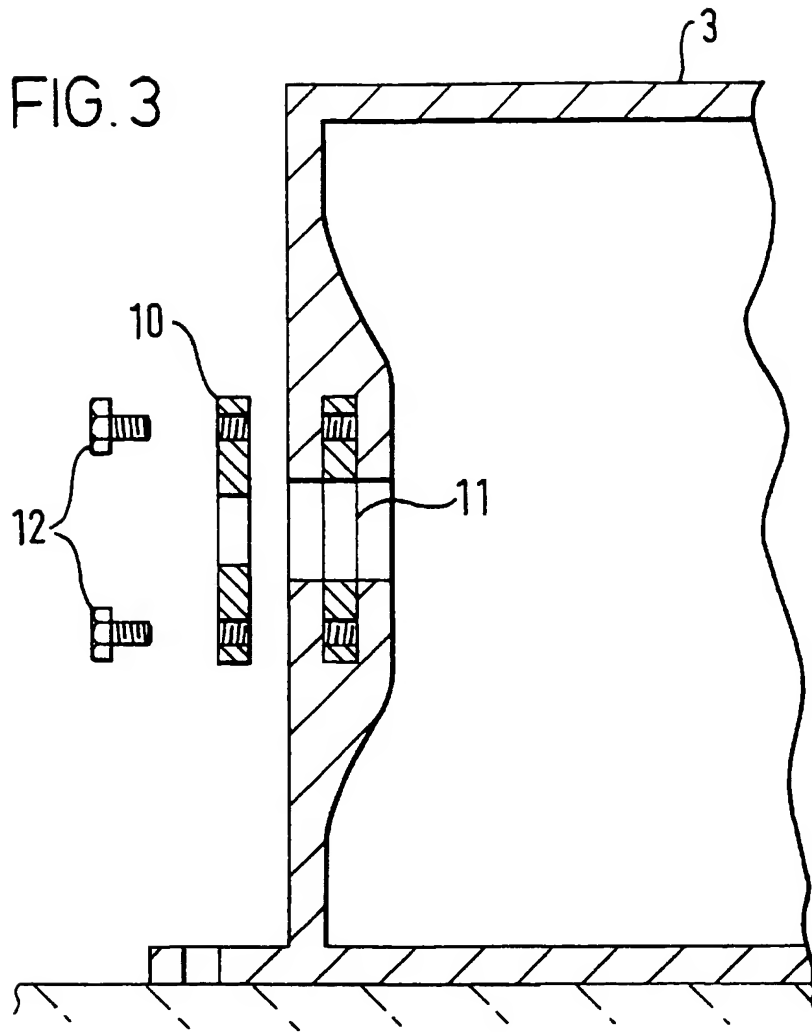


FIG. 4

A DEVICE FOR SPEED RESTRICTION OF VEHICLES

The present invention relates to a speed restriction device. More particularly it relates to an adaptive speed restriction device.

5

BACKGROUND OF THE INVENTION

Today's motorized traffic requires various means of control, especially with respect to speeding. A common feature in many urban roads are the speed restriction humps. These speed restriction humps are designed to
10 impose an obstacle to speeding vehicle passes over such a hump the vehicle is rocked, imposing significant inconvenience to the driver and passengers. An experienced driver slows down to pass over such humps in a relatively slow speed, in order to avoid the shock, thus traffic speed restriction is obtained. The faster the vehicle is driven over the hump the
15 harder the vehicle is rocked.

Widely in use are the concrete or the asphalt road humps. However, being made of rigid materials, these road humps impose inconvenience to all vehicles passing over them, even to such vehicles driven at a slow, legal speed.

20 In the U.K. Patent. 2,030,197 (Williams et al.) a portable road vehicle speed restriction was described. It comprises a plurality of individually portable, rigid or semi-rigid members, each having a flat base and an upper surface which is shaped to present a hump. These members were adapted to be assembled side by side to form an elongate hump of
25 continuous uniform section accross the path of road vehicles.

It is an object of the present invention to provide an adaptive speed restriction hump which will efficiently impose a speed restriction on vehicles speeding over the allowed legal speed, and yet minimize the inconvenience for obedient drivers driving at speed within the allowed
30 speed limit.

Figure 3, depicts a vent suitable for use in the device of the present invention, with adjustable aperture.

Figure 4, illustrates another typical use of the adaptive speed restriction device according to the present invention, wherein a plurality of elements
5 is laid parallel to each other, at predetermined distance apart.

DETAILED DESCRIPTION OF THE INVENTION AND DRAWINGS.

Figure 1 illustrates two typical embodiments of the adaptive speed
10 restriction device according to the present invention.

Figure 1a illustrates an adaptive speed restriction device. It comprises a hollow, elongated element (1), consisting of an impervious casing (2). The device has an elastic, resilient upper surface presenting a hump (3). On the side wall (4) of the casing two vents are provided: one vent (5) allows
15 air to flow, up to a predetermined maximum flow rate, from the space within the casing outwardly or in the opposite direction. The other vent (6) is a valve, allowing for the air to flow only in one direction: from outside the casing into the space within the casing. The device casing is provided with a frame (7) having bores (8) suited for screws or nails to be
20 used for fixing the device in place onto the road surface.

Another typical embodiment of the present invention is illustrated in Figure 1b. At each end of the element there are anchoring means (9) for fixing the device in place and for a quick and efficient discard.

In the embodiments of the present invention, the upper surface of the
25 device, possesses elastic and resilient properties, which can be achieved by using elastic materials such as synthetic rubber (as used for car tires) or other materials having these properties.

Reference is now made to Figure 1a, wherein the upper surface of the speed restriction device shown has one or more vents, located substantially near the upper surface ends, so that the passing vehicle will not obstruct the vent action.

- 5 The vent (5) has a predetermined or an adjustable aperture, so as to allow for a predetermined maximal flow of the air through it, when the upper surface (3) is subjected to external pressure produced by a passing vehicle.

The device casing (2) is impervious in order to prevent the air within the
10 device casing from escaping other than through the vent. The device of the present invention is placed across the traffic lane to be controlled, so that any vehicle traveling on that line will be forced to pass over the device and consequently be forced to slow down to a predetermined allowed speed.

- 15 When a vehicle passes over the speed restriction device according to the present invention (Figure 2), it exerts pressure onto the upper surface (3) in contact with the respective wheels, which is transformed to the air present inside the device casing. The pressurized air within the device casing can escape only through the vent (5), wherein the vent's aperture
20 is set to allow for a predetermined maximal flow rate of air. When the said vehicle is traveling at a speed lower or equal to the predetermined maximal allowed speed (Figure 2a) the vent (5) allows for a relatively free flow of the air from under the upper surface of the device, and the upper surface (3) collapses under the weight of the vehicle to present a
25 substantially flat surface. The driver as well as the passengers in the vehicle will feel very little, if any, inconvenience when passing over the speed restriction device.

30

However, if the vehicle passing over the device as described in the present invention is traveling at a speed greater than the predetermined allowed speed (Figure 2b), than the rate of pressure build-up imposed by the impact of the vehicle on the upper surface (3) of the speed restriction device would be greater than in the earlier case, and the predetermined aperture of the vent (5) will not suffice for a thorough exhaustion of the air from the device casing (2). As a result, the upper surface (3) of the device will not collapse totally and the passing vehicle will be rocked by the still present hump. It is quite clear that for all speeds greater than the predetermined allowed speed, the greater the speed of the passing vehicle, the higher the hump will remain and accordingly the shock of the impact will be greater. The resulting inconvenience for the driver and the passengers will be greater too.

Optionally, the vent aperture is made to be adjustable (Figure 3). In this way the speed restriction device can be used in different traffic conditions, and would impose speed restrictions for various speeds as desired. A larger aperture will impose a faster speed limit whereas a smaller aperture will impose a slower speed limit.

In the typical example as illustrated in Figure 3 the aperture diameter is determined by a replaceable aperture disk (10), which is mounted over the basic aperture (11), the latter being suitable for determining the maximum possible allowed speed (e.g. the highest allowed legal speed limit for highways), and secured in place by screws (12). The replaceable aperture disk (10) should have a smaller aperture than the basic aperture (11) which will impose a lower speed limit consequently. By providing a set of different aperture disks, each having a different size aperture, this embodiment would enable a flexible use of the device in a variety of speed limits as desired by the user.

Another advantage of the device of the present invention is its mobility, which enables to be used for temporary speed restrictions, as in the case

of traffic control near road repair works, at events controlled by police, where temporary speed restrictions are demanded, like on a traffic accident location, etc.

5 An optional use of the present invention would require a plurality of elements, laid parallel to each other, at predetermined distances apart (Figure 4). The first adaptive speed restriction device (13) in the direction of traffic would be set to impose a relatively high speed restriction, followed by the next device (14) set to impose slower speed restriction, and so on (15). This embodiment is most preferred for use when a
10 temporary speed restriction is required on a highway where the traffic is heavy and fast.

It should be pointed out that the embodiments as described herein and the attached Figures are presented for illustrative purposes only, without limiting the scope of the invention as shown in the appending Claims.

15

20

25

30

CLAIMS:-

1. An adaptive speed restriction device, comprising an elongated hollow element of a predetermined length, having an impervious casing consisting of at least one upper surface presenting a hump, said upper surface being elastic and resilient, having at least one vent, located on said casing, and allowing for the flow of air at a predetermined rate, directed from the space inside said casing outward, said casing being provided with means for allowing the flow of outside air into the space within the casing.
2. The device according to Claim 1, wherein said vent is provided with an adjustable aperture.
3. The device according to Claim 1, wherein the casing has at least one side wall on which the said vent is located.
4. The device according to any of Claim 1, wherein at least another vent is provided, said vent being a valve, allowing for the air to flow uni-directionally from outside the casing into the space within the casing.
5. The device according to Claim 1, wherein said casing is provided with a frame.
6. The device according to Claim 5, wherein said frame is provided with bores suited for screws or nails for fixing the said device onto the road surface.
7. The device according to any of Claim 1, wherein said device has anchoring means at its ends.
8. An adaptive speed restriction device substantially as hereinbefore described, with reference to Figures 1a and 1b of the accompanying drawings.



Application No: GB 9809155.6
Claims searched: 1-8

Examiner: Caroline Marshall
Date of search: 27 May 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): E1G (GLN)

Int Cl (Ed.6): E01F 9/00, 9/047, 13/00.

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2 288 419 A (Beveridge) - see whole document.	-
X	US 4 362 424 (Barber) - see whole document, especially lines 17-30 of column 3, and fig. 4.	1, 3, 5 and 6

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☒ FADED TEXT OR DRAWING
- ☒ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☒ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☒ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.